Skybridge Spectrum Foundation
Telesaurus Holdings GB LLC
2649 Benvenue Ave, 2-6
Berkeley CA 94704
510.841.2220

Submitted on ECFC in FCC 06-49, LMS-M NPRM
June 20, 2008

Attached is a report of presentations on TETRA or US PMR, including LMS-M based ITS wireless across the US, made at the NPSTC June meeting in DC.

Marilyn Ward, CEO of NPSTC, invited Mr. Havens to make this presentation, after discussion with a representative of NTIA OSM who attended pervious meetings Mr. Havens organized on TETRA for US PRM including ITS wireless.

The lead presentation was by Warren Havens, President of the above-captioned LMS-M licensees. The supporting presentation was by Roger Dowling, a Board Member and a Director of the international TETRA Association.

TETRA is the leading technology and equipment in the world for advanced mission-critical radio. It is standards (ETSI) based, has a large number of manufacturers of infrastructure and terminals, has excellent data capabilities up to 100's kbs, with good coverage range, has end-to-end security, and is cost effective. It is widely used in all part of the world except in the US and Canada, due to certain blocking by Motorola.

Mr. Havens and his LMS-M licensee companies and Foundation have taken the lead, for the last several years, in finding and pursuing legal-rights and other solutions to this blockage. See www.tetra-us.us. This was presented at the NPSTC meeting, as previously this year to UTC, AAR, API, ITS America, ITS California, other principal associations of US PMR, members of Congress, and others.

The attached report is filed in this docket since it demonstrates major due diligence and progress in obtaining appropriate technology and equipment for LMS-M: the vehicle to ITS system two-way data component, and emergency voice, to support the required radiolocation multilateration that is the basis of LMS-M and is entirely essential to augment GPS for advance ITS in the US: lane-based travel and other intelligent individual and group vehicle movements, without which we cannot solve the massive and growing land transport problems of accidents, congestion, pollution, excess fuel consumption, loss of time, environmental and social burdens, etc.

This report shows a major step forward to obtain TETRA for US PMR including ITS: a technical study of TETRA vs. P25 under NPSTC auspices, and also reflects important articulation by the NPSTC board as to NPSTC principals, functions, and objectivity which may lead to such availability in the reasonably near future.

TETRA-US Presentation

Before the NPSTC Board and Staff
and other attendees

June 18, 2008, at the Crystal Gateway Marriot Hotel, Arlington, VA

Summary Notes for www.tetra-us.us Blog

The following are not verbatim but from the recollection of Warren Havens who was at this meeting, and was one of the presenters. Any material errors pointed out will be corrected. There were some presentation points and following exchanges that many not be reflected below, but the following are the essential ones.

The presentation Powerpoint will be on the NPSTC website soon, under this recent meeting. It is now on our tetra-us website at:
http://web.mac.com/warrenhavens/iWeb/Site/Blog/Blog.html
- - - -

The TETRA-US presentation and its presenters were introduced by the session Chair, Tom Sorley, NPSTC Tech Committee Chair.

Warren Havens (coordinator of TETRA-US Initiative and President of Telesaurus LLCs and Skybridge Spectrum Foundation) presented the problem directly: the Motorola blocking of TETRA in the US, and the legal solutions as to why Moto cannot block; why TETRA is good for US PMR including P25 in the US; why his companies need TETRA for wide-area ITS wireless; how TETRA is roughly 3X more cost effective vs. P25 and has far better data capabilities; that NTIA and FCC rules allow 4-slot TDMA in 25 kHz, etc. The presentation included that interoperability with P25 will not be difficult.

Then, Roger Dowling (TETRA Association Board Member, and market development director, Sepura), presented a summary of TETRA technology, TETRA systems worldwide (except US and Canada, which are blocked by Motorola), TETRA market segments, data capabilities up to TETRA Release 2 (100's kbs), TETRA terminals' built-in repeater mode, etc. Mr. Dowling also referenced several current-generation terminals (that he had with him) from Sepura and noted that cost is under $800 with potential lower prices in larger volumes, and that TETRA equipment pricing continues to decrease with volumes, competition, etc.
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The session Chair, Tom Sorley (see above) then called for questions, noted that time was short (dut to further agenda items to follow), and noted that John Powell had requested to be first.

Mr. Powell gave on a long speech about how he had determined years ago that TETRA was not good for the US, that the US is different from EU (in population density and user needs) that TETRA is for high-density areas and does not have substantial range, that TETRA is not more cost effective than P25 when all things considered, etc.

Mr. Dowling then asked, what was the question? Mr. Powell did not respond to this, nor had he posed a question.

Mr. Havens responded to Mr. Powell that, with experts, his companies and Foundation has studied the allegations Mr. Powel just raised, that they are not correct, and that the TETRA deployments speak for themselves. Mr. Havens also said that there should be free competition - that is healthy.

One new NPSTC board member, Brian Fontes, Ph.D., CEO of NENA,[1] responded pointedly to Mr. Powell that his remarks were out of line, and asked the entire NPSTC Board if he was correct or not that NPSTC did not advocate a particular technology, and the Board indicated concurrence.

Following Mr. Fontes' points, another member of the NPSTC Board (in the tables that had the Board members seated) noted in response to Mr. Powell that NPSTC is a clearinghouse of information for its members, and they ultimately decide on technology

[1] Mr.Brian Fontes, Ph.D., CEO of NENA: see: http://www.nena.org/media/File/Fontes_CEO_Announcement_4_30.pdf, http://www.npstc.org/memberorgs.jsp (NENA as NPSTC member).

and equipment.

Then a NPTSC representative (either Tom Sorley [see above] or a Board member- I cannot recall) further responded to Mr. Powell that his views were just his views, and the presenters had their views (which they were invited to present), and suggested that NPSTC set up a tech study group to compare TETRA with P25.

Messrs. Havens and Dowling then agreed that was a good idea. The NPSTC board indicated consent, and Mr. Sorley indicated he would proceed with this.

From the NPSTC Board, a comment was made to Mr. Havens' remark to Mr. Powell that competition from TETRA will be healthy: that while that may be true generally, interoperability with P25 is important. Mr. Havens agreed (and had noted that in his written and oral presentation), and Mr. Dowling indicated his concurrence.. This, then, became an important component of the planned TETRA-P25 tech study.

Mr. Dowling and Havens thanked the NPSTC Board and staff for the valuable opportunity to present, and for the invitation to the tech study comparing TETRA and P25. In departing, they received round of applause, apparently from most attendees.

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Afterward, Mr. Sorley briefly discussed with Mr. Dowling and Mr. Havens concerning the planned tech study. In addition, several NPSTC Board members briefly noted appreciation for the presentations, including Mr. Brian Fontes of NENA (see footnote above), Mr. William Brownlow of AASHTO,[2] Mr. Lloyd M. Mitchell of NASF,[3] and Mr. Harlin McEwen, of IACP, and Vice Chair of NPSTC.[4] (That does not imply agreement with any particular points presented, although some discussion apart from NPSTC organizational goals was exchanged.)

In sum, NPTSC gave the presentation due consideration, its Board members comments on procedure and principals were very much welcome and in the public interest, and the TETRA-P25 comparative tech study project initiated at the session should be very beneficial for advancing PMR or public safety organizations in the US, and the entire US PMR.

In addition, in his oral presentation, Mr. Havens also summarized the goals of ITS wireless, as being pursued by his commercial and nonprofit companies: to greatly reduce accidents, congestion, pollution, and fuel consumption on the nation's roadways, and why TETRA is essential for that (for the vehicles to ITS system constant data exchanges). (More on this at www.telesaurus.com and www.atliswireless.com.)

Mr. Havens also noted in his presentation that the entire US public safety and critical transport and infrastructure markets could be cleared of the current blockade of TETRA imposed by Motorola by US DHS (or other Federal agencies) exercise of their authority under 28 USC §1498, and suggested that NPSTC join in seeking this, in accord with the draft petition for this purpose set forth at www.tetra-us.us.

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It is noted here that there were persons in attendance from Motorola and DHS. They made no comment during this session nor afterward to Mr. Havens or Mr. Dowling.

A number of other attendees active in US PMR, including Mark Hoppe, Joe Gallelli, and Richard T. Frey III, commented favorably on the presentation and the resultant planned TETRA-P25 tech study project as major advances in US PMR.

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In accord with the public, open nature of the TETRA-US Initiative, these notes are posted on the website.

Submitted, June 20, 2008, by

Warren Havens,

President,
Intelligent Transport, Location & Wireless Group:
ATLIS Wireless LLC, Telesaurus LLCs, &
Skybridge Spectrum Foundation
Berkeley, California, USA
www.atliswireless.com
www.telesaurus.com
www.tetra-us.us
510.841.2220
warren.havens@sbcglobal.net

[2] Mr. William Brownlow of AASHTO: see: http://www.npstc.org/bios.jsp#BrownlowWilliam .
[3] Mr. Lloyd M. Mitchell of NASF: see: http://www.npstc.org/bios.jsp#MitchellLloyd .
[4] Mr. Harlin McEwen, of IACP, and Vice Chair of NPSTC: see: http://www.npstc.org/bios.jsp#McEwenHarlin

At the NPSTC June 2008 meeting, on Weds. 18th

TETRA -- Current US Initiatives

Presenters:

- Warren Havens, President,
  Skybridge Spectrum Foundation & Telesaurus LLCs, CA
  www.tetra-us.us, www.telesaurus.com, warren.havens@sbcglobal.net
- Roger Dowling, Director & Board Member,
  TETRA Association, & Market Development Director, Sepura, UK
  www.tetramou.com, www.sepura.com, roger.dowling@sepura.com

At www.tetra-us.us -- *TETRA*- US Initiative

US TETRA Initiative | TETRA Legal Use Rights | TETRA Links | TETRA vs P25 | US Gov - TETRA 1
US Gov - TETRA 2 | Las Vegas Meeting Notes | DC Meetings & Materials | TETRA Growth & Status Worldwide
TETRA Diagrams: Tech & Functions | TETRA Pics: Radios & Products | US TETRA Equipment & Bands
Petition to US DOC, DHS | Blog

Site purpose & introduction *[*]*

RSS *Subscribe* to updates and news: Go here >>>>>

This site supports introduction and use of ***TETRA*** radio technology and equipment for advanced PMRS wireless in the US, on land, sea, and air, for public safety and other agencies, Intelligent Transportation Systems, emergency responders, critical infrastructure and private enterprises.

This is directly highly beneficial to these markets, and also provides, for users of other private land mobile radio equipment including P25 and OpenSky, needed competition. Support of restraint of competition among P25 interests is contrary to US free-market foundations and law.

This initiative is necessary, and lack of knowledge of ***TETRA*** in the US exists, due to Motorola's refusal to license its US patents essential to ***TETRA*** (other US patentees grant licenses worldwide).

- ***TETRA Legal Use Rights***: (i) Current rights of US federal and state agencies, and parties they authorize, to buy and use ***TETRA*** equipment under applicable law and US Supreme Court decision; and (ii) Federal Proclamation sought: Go here >>>>>>

These parties have rights to buy and use equipment that employ technologies under US patents-- without being subject to patent infringement actions, but to payment of fair compensation to holders of valid patents. To date, this information has been absent in the public communications of the US land mobile radio community, which has, instead, assumed that no party can buy and use ***TETRA*** equipment in the US due to patent holder(s) withholding of patent licenses deemed essential for ***TETRA***.

- ***TETRA Links***: Links to TETRA Association, equipment companies, etc.: Go here >>>>>>
- ***TETRA v APCO 25***: Comparisons: advantages of ***TETRA*** for larger and expanding systems, in cost, etc.-- Go here >>>>>>

- ***US Government current use, testing of Tetra***: For armed forces internationally, and domestic public safety -- Go here >>>>>>
- ***TETRA for Intelligent Transport, Energy & Environment***: Go here >>>>>>
- ***TETRA-US meetings, minutes, etc***: Go here >>>>>>
- ***Declaration of TETRA Equipment, Spectrum, etc. for US: 150-900 MHz:*** Go here >>>>>>
- ***Petition to US DOC, DHS for Proclamation to clear US markets for use of TETRA***: Go here >>>>>>

* * * *

Purpose

Clear assumed & actual legal blocks to *TETRA* in US.

Organizers

Warren Havens, Skybridge Foundation & Telesaurus, for US Intelligent Transport Systems (ITS) wireless.

Others

Many *TETRA* equipment companies, & US entities seeking access to *TETRA*.

Beneficiaries

All US PMR. Extension to Canada PMR.

For US PMR Bands

VHF-222 MHz, 400 MHz, 700-900 MHz.

*At www.tetra-us.us (p. 2) -- US **Federal** Agencies Cannot be Blocked*

Problem

Motorola holds US patents for *TETRA* and will not license them for sale and use of *TETRA* in the US.

Solution

No US patent holder can block any US Federal agency or party acting for the agency from purchase and use any thing made with a US patent, including *TETRA*.*

DC Circuit Court: "This is a 28 U.S.C. §1498 action . . . the patent owner is seeking to recover just compensation for the Government's unauthorized taking and use of his invention. The theoretical basis for his recovery is the doctrine of eminent domain. . . . In this context, the United States is not in the position of an ordinary infringer . . . but rather a compulsory, nonexclusive licensee. . . . *Motorola v. US*, US 729 F.2d, 765, March 8, 1984." *

28 U.S.C. § 1498: ". . . Whenever . . . a patent of the United States is used . . . for the United States without license of the owner thereof or lawful right to use or manufacture the same, the owner's remedy shall be by action against the United States . . . for the recovery of his reasonable and entire compensation for such use and manufacture. . . . [T]he use[of] a patent . . . by . . . any person, firm, or corporation for the Government and with the authorization or consent of the Government, shall be construed as use . . . for the United States." *

* 4 legal memos on above are downloadable the website, page 2. This is settled law.

At: **www.tetra-us.us** *(p. 2) -- US **State** Agencies Cannot be Blocked*

Problem

Same as on page above.

Solution

No US patent holder can block any US State agency or party acting for the agency from purchase and use any thing made with a US patent, including *TETRA*, based on the 1999 US Supreme Court decision, *Florida Prepaid*.*

From US GAO Report 01-811, "Intellectual property--which includes federally granted patents…--is often owned or used by state governmental entities... Until recently, state entities that made unauthorized use of, or "infringed," the intellectual property of others were subject to lawsuits in federal court. In June 1999, however, the U.S. Supreme Court held that states were not subject to such suits, striking down a federal law that would have taken away a state's right to claim immunity under the Eleventh Amendment of the U.S. Constitution when sued in federal court for patent infringement…. *Florida Prepaid Postsecondary Education Expense Board v. College Savings Bank*, 527 U.S. 627 (1999)…."

In sum, States, and their authorized agents, can use any thing made with a US patent under the State's eminent domain rights and procedures, without being subject to suit for US patent infringement.*

* Legal materials on above are at the website, page 2. This is settled law.

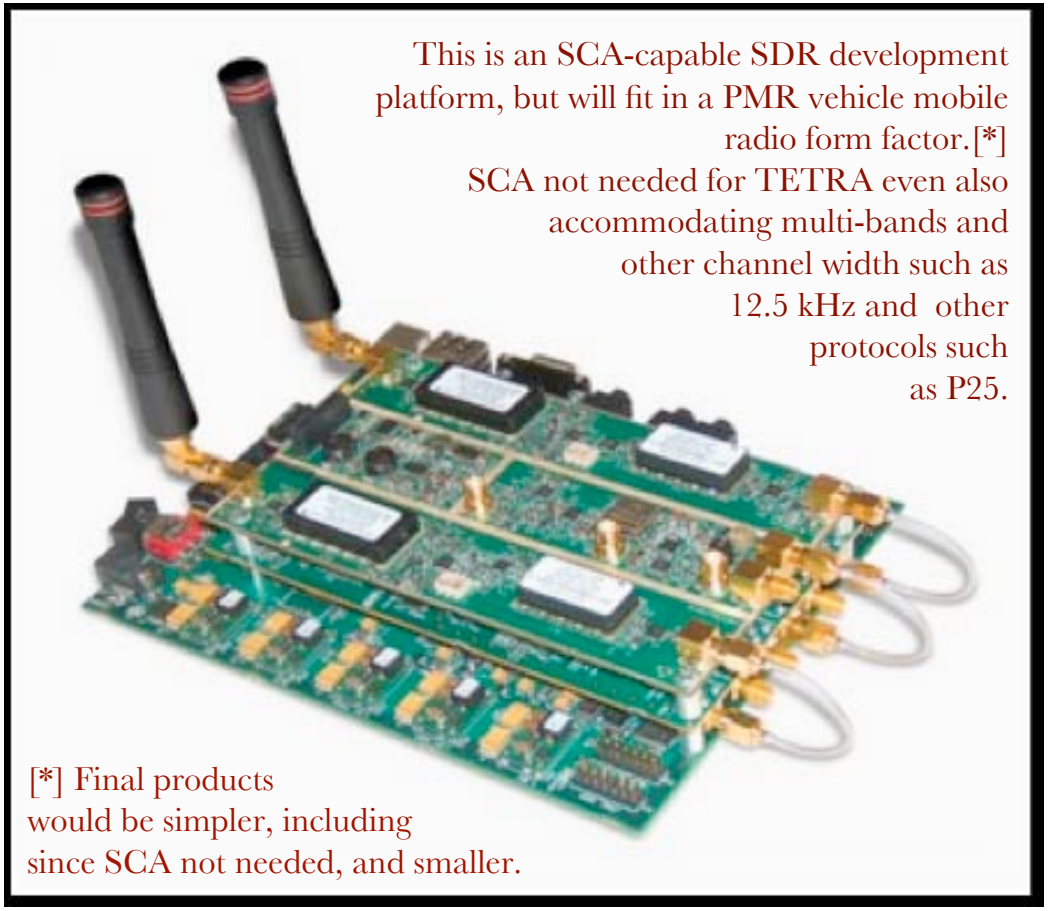
At: **www.tetra-us.us:** *Why TETRA is good for US PMR*

More competition, choice, & advanced PMR progress

- Competition with P25 will be healthy.
- Competition is fundamental to free markets.
- Competition leads to cross-fertilization.
- *TETRA*-P25 interoperability not difficult: IP, SDR (next page), etc.

Better performance & cost (often) vs. P25 & proprietary

- *TETRA* is more widely used in the World, higher volumes, most cost effective. Sub $1,000 for high end *TETRA* radios; Sub $600 for some Asian models. Lower cost of coverage and operation at least for medium-to-higher capacity systems.
- Better for common data, & *TETRA* Rel. 2 (ready now) up to 400 kbs.
- Contrary to some US views: *TETRA* range is good and is now extended, direct talk works well, and 4-slot TDMA in 25 kHz channels *IS* acceptable under NTIA rules, as well as FCC rules, in all bands, VHF to 900 MHz.



This is an SCA-capable SDR development platform, but will fit in a PMR vehicle mobile radio form factor.[*]
SCA not needed for TETRA even also accommodating multi-bands and other channel width such as 12.5 kHz and other protocols such as P25.

[*] Final products would be simpler, including since SCA not needed, and smaller.

PMR will be **SDR** based soon including for terminal radios.

Multi-protocol including *TETRA* and P25.

Multi-bands: VFH to 900 MHz.

PMR & Intelligent Transport Systems (ITS) are, after military, next for SDR.

TETRA in US
will accelerate
*ITS & **PMR SDR.***

Above: Example: **Lyrtech** (Canada) Small Form Factor (SSF) **SDR** development board for dual-protocol ***TETRA*, P25**, etc. and dual-band from **200 to 900 MHz+**, with Texas Instruments & Xlinx. Being tested with, for e.g., **Etherstack's** TETRA protocol stack software. SDR is the future, not far off, of at least vehicle-based PMR that has no power, size, and weight limitations.

Above and similar, in final forms and commercial volumes, expected to yield $1,000-$1,500 terminals ~ 2010 from discussion with Lyrtech and other similar companies.

[End of Havens presentation.]

Critical communications for all professional users

TETRA Markets

Roger Dowling
Director & Board Member The TETRA Association
Director Market Development Sepura

Critical communications for all professional users

What is TETRA?

International digital radio standard

Designed specifically for public safety professionals and for those who work and need to communicate in groups

Evolving, open, ETSI-standard

Instant push to talk, group voice communications

End to end, secure voice and data transmission

TETRA Release 2 will provide 3G-like data rates

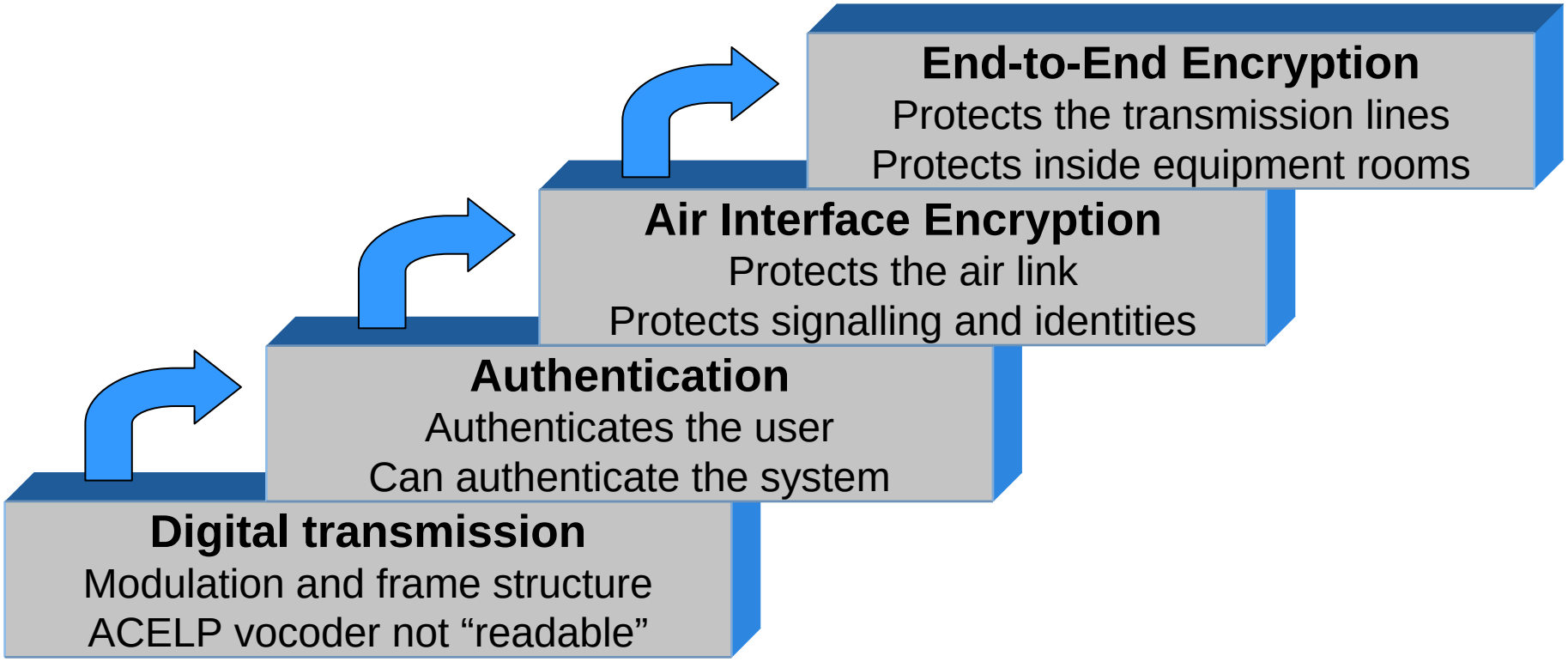
In use in many sectors in over 100 countries

TETRA is “feature rich” including

Very, very, very clear digital speech
Group calls, personal calls, telephony, direct mode
Fast call set up times
Seamless roaming
Equipment interoperability
Operational and administrative interoperability and flexibility
Total management
Privacy and security
Spectrum efficiency. TDMA trunking
Voice and data – up to 600+ kbits with TETRA 2
As much as you want or as little as you want

Critical communications for all professional users

The most secure in the world



The TETRA Association

Over 150 Members around the world

Involved in the development, deployment or use of TETRA

The Association:

- Promotes TETRA
- Lobbies Governments and Regulators
- Manages IOP Testing and Certification process
- Continues to develops TETRA through its operator and user groups, Technical Forum, SFPG and marketing groups

TETRA Contracts

TETRA now installed in 103 countries worldwide (65 of which are outside Europe)

Total number of reported contracts increase by 38% since last year to over 2,000

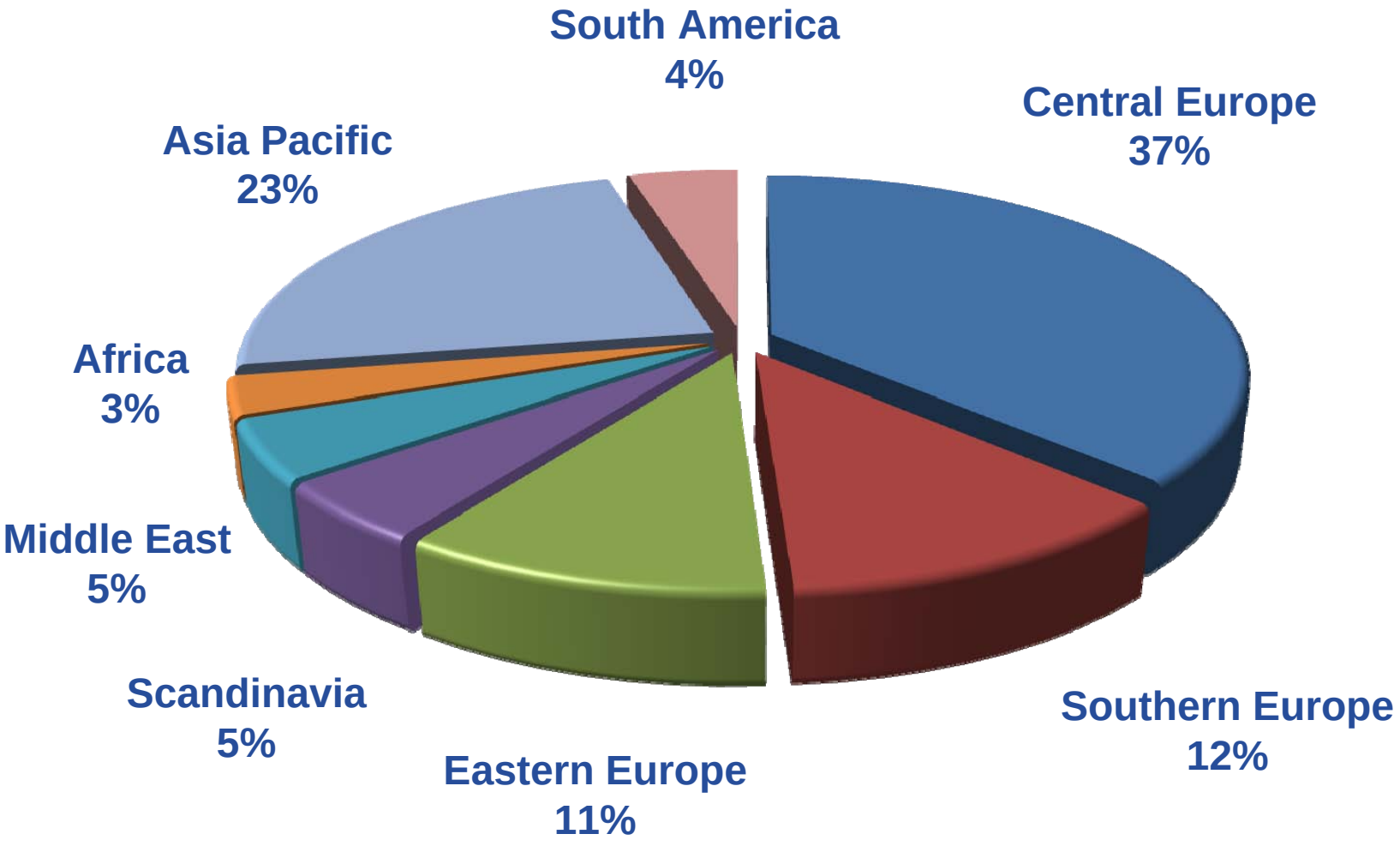
The fastest growing Regions Asia Pacific (98%) and Eastern Europe (48%)

The fastest growing market sectors are Oil & Gas (110%) and Commerce & Industry (94%)

Note – not all manufacturers are reporting

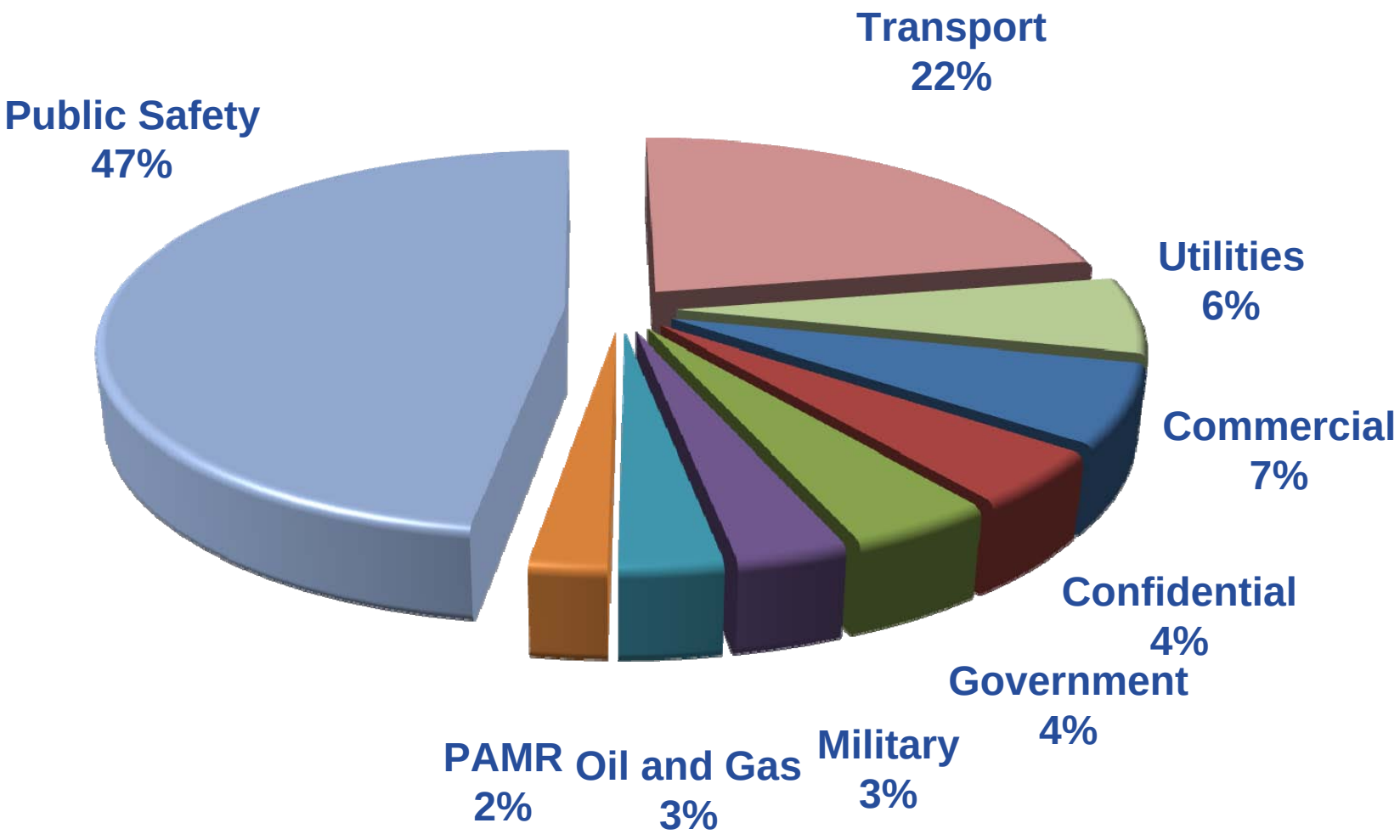
Critical communications for all professional users

Contracts by Region – Everywhere except North America



Critical communications for all professional users

Contracts by Sector



15 companies participate in IOP testing

11 different infrastructures

More than 25 terminals from 11 suppliers

3T Communications AG
MEMBER OF FREQUENTIS GROUP

ARTEVEA digital

CLEARTONE RADIO COMMUNICATION SYSTEMS

EADS DEFENCE & SECURITY

MOTOROLA

PMRS

ROHDE&SCHWARZ
R&S BICK Mobilfunk GmbH

ROHILL

SELEX Communications

sepura

Software Radio Technology

teltronic

THALES

Tyco Electronics

UNIMO

Over 200 IOP certificates issued

Critical communications for all professional users

IOP - Win win – Why TETRA has been so successful

For operators/users

Manufacturer independent supply and 2nd source guarantee

Benefits of competition

- Wider selection of products (gateway, special terminals etc) and functionality
- Lower prices
- Constant improvements

Increased speed of innovation

For manufacturer/suppliers

Larger (global) market

- For longer
- Critical mass for special products
- Potential to focus to own strengths
- Increased investment opportunity
- Faster time to market

One common and independent specification

- No vendor bias

Critical communications for all professional users

Who uses TETRA ?

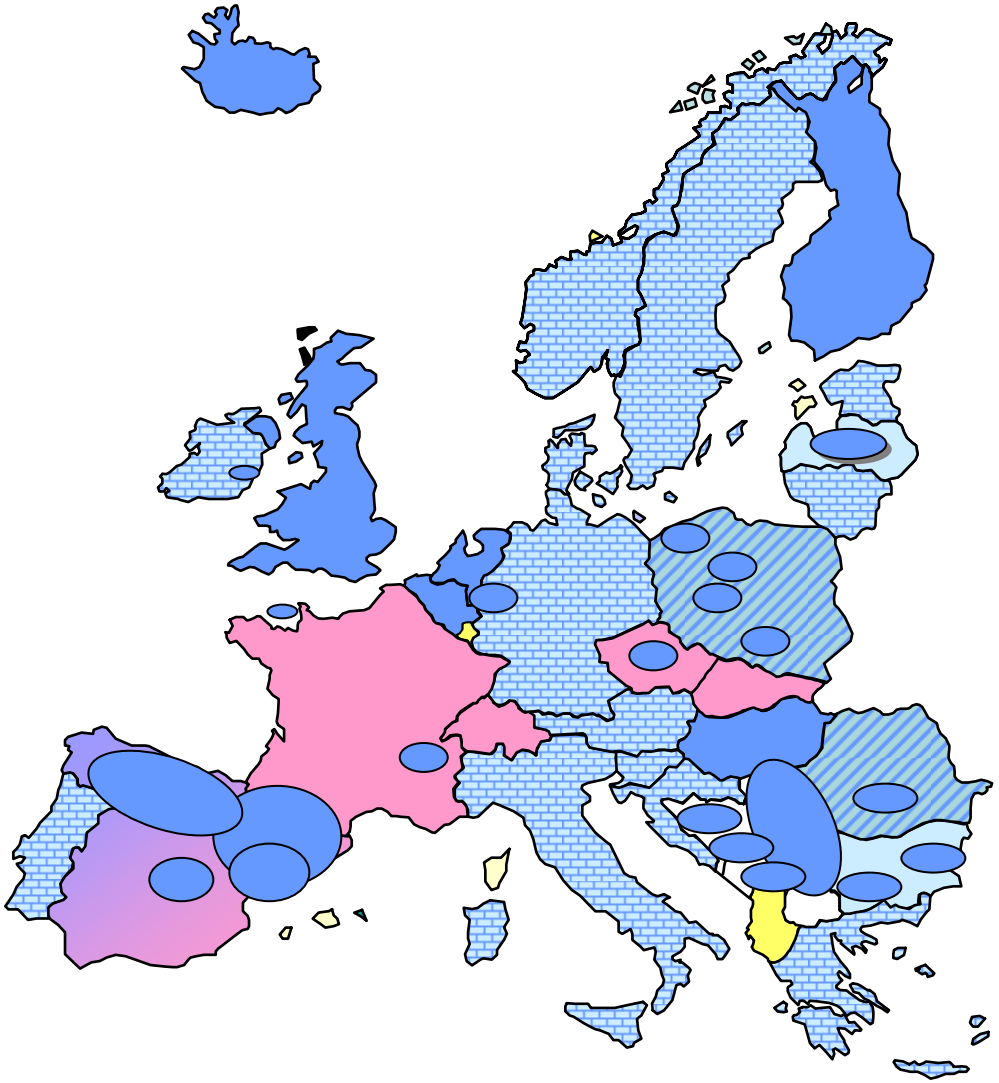
Critical communications for all professional users

Public Safety

Critical communications for all professional users

European Public Safety Networks

Key	
Nationwide TETRA	
Regional TETRA	
Nationwide TETRA under construction	
Project in progress likely to be TETRA	
Other technologies	
No project known	



Critical communications for all professional users

Airwave

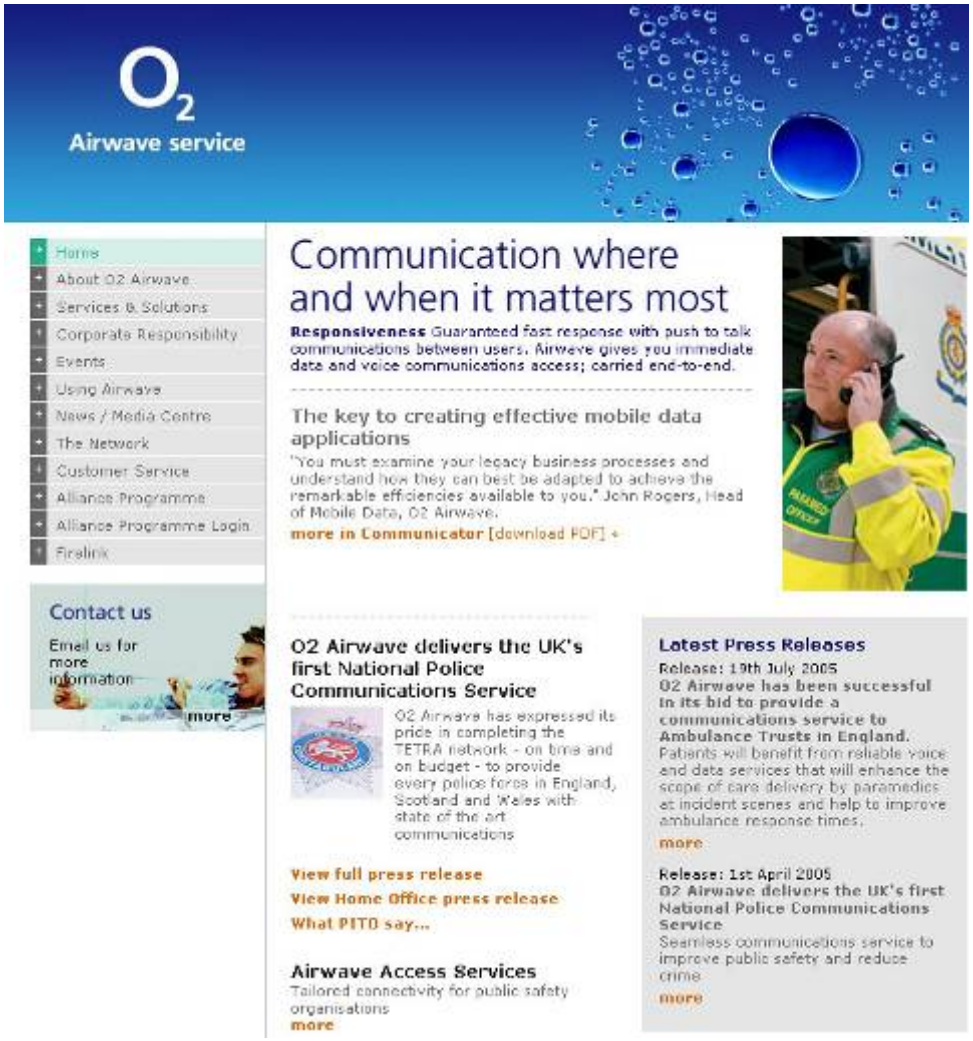
UK Police, Fire, Ambulance and other Public Safety users

Largest system in the world – until Germany rollout completed (500,000 public safety users)

3,300 base stations

250,000 operational users

One infrastructure supplier multiple terminal suppliers



See - www.airwaveservice.co.uk

Transport

Largest sector after Public Safety

Trucks, Buses, Trams, Railways, Metros, Taxis, Airports……

Buses and Trams

TETRA is ideally suited …..

Passenger information

Vehicle positioning

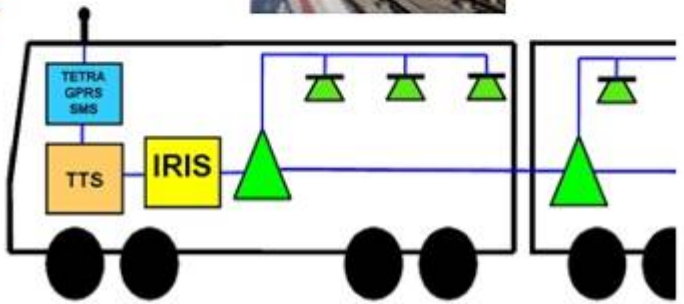
Voice calls

Emergency button

Bilbao Bus text to speech conversion

Dominion
tecnologías

metro bilbao



Command and Control Room

Text to Speech Equipment:

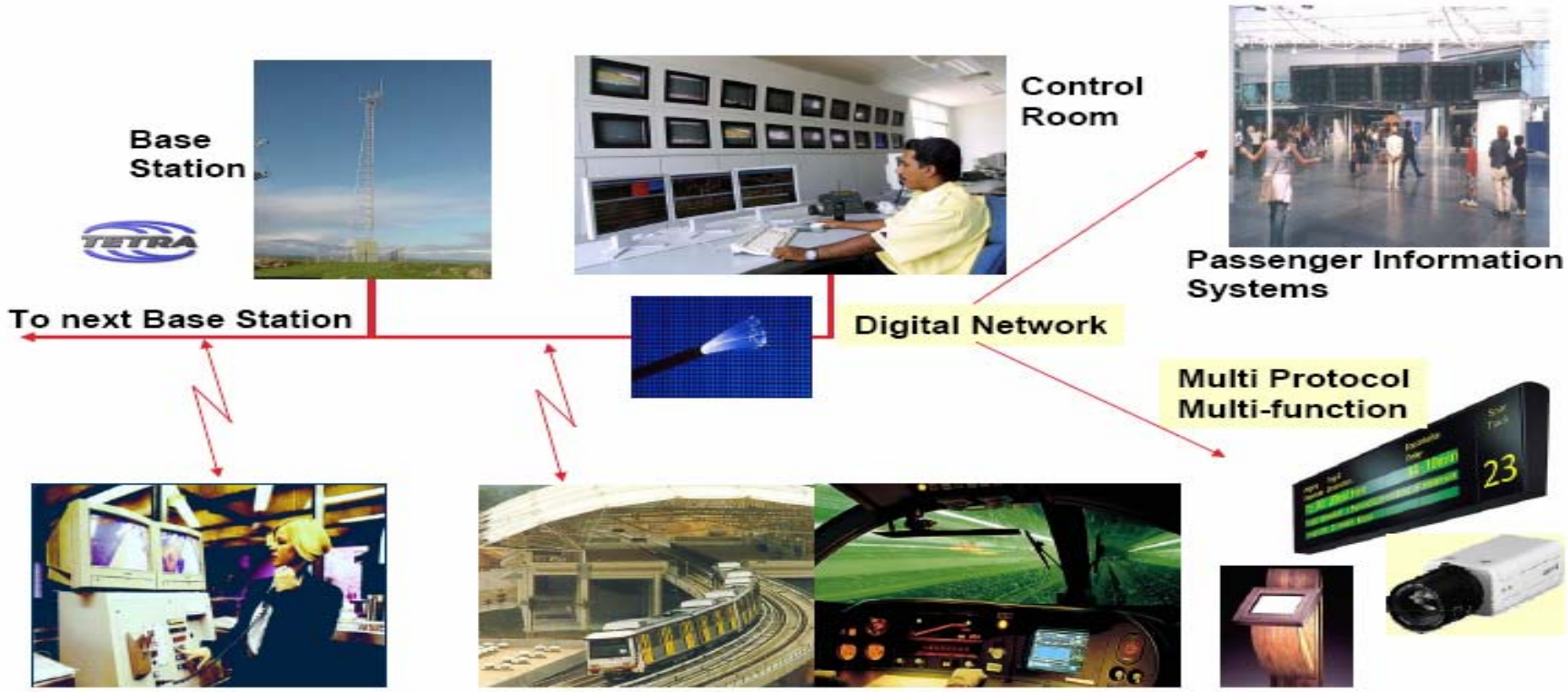
- *"Text to Speech" Spanish and Basque*
- *Railway Regulation Compliant*

Metros all around the world

Critical communications for all professional users

And Railways from Brazil to China

SUNGARD Overview Of A Typical System



Critical communications for all professional users

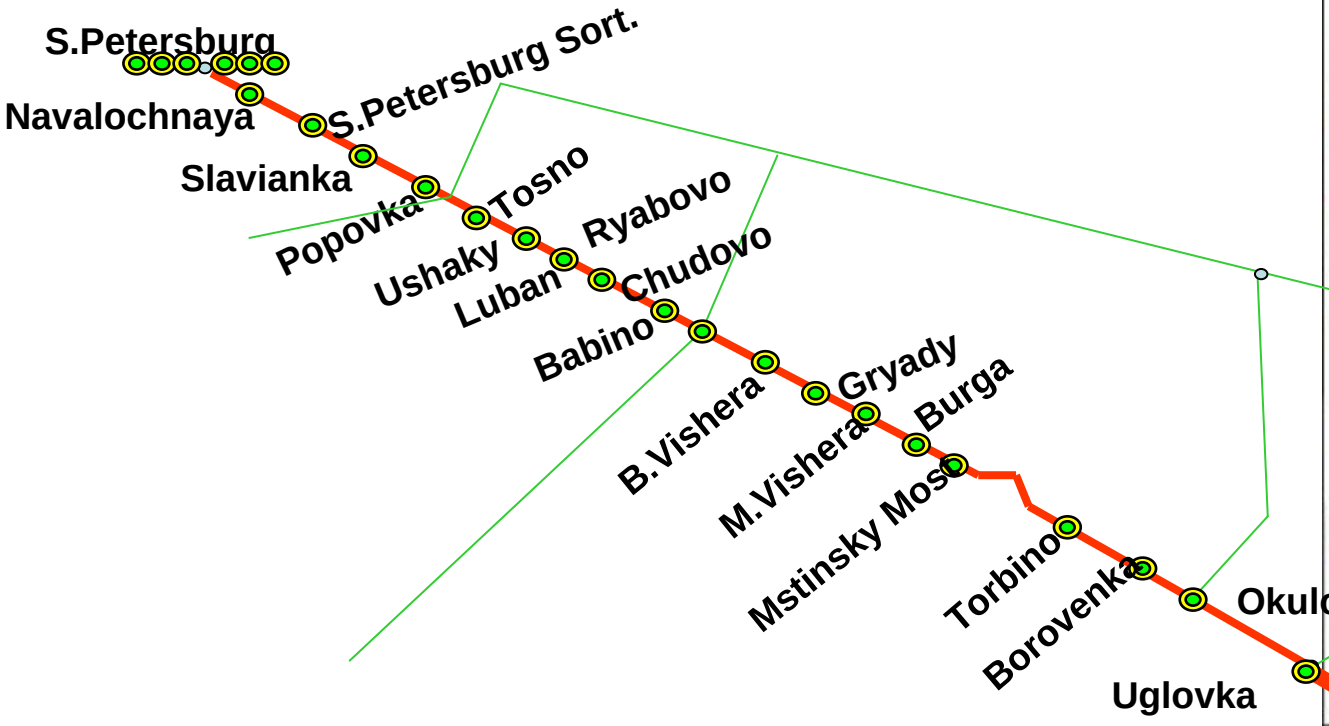
Moscow - Saint Petersburg Railway

Installed 2004. Over 500 miles in length

System with redundant node and 51 base stations

Redundant Network Management and line control systems

Recording of all communications



SNCF

Rail speed record of
359.3 mph
with continuous
clear TETRA speech

Airports

Germany, Spain, China, UK and many more

Schiphol Airport, Amsterdam

45 million passengers (2006) 60,000 staff
Approx 3,500 mobile radio subscribers
Fully redundant TETRA platform
One main 16-carrier site with:
- 2 Main Control Channels for signaling and short data messaging
- 62 Traffic Channels for voice and data traffic

One remote 2-carrier site for remote runway
Full system backup for contingency purposes
Out-door coverage in working area of 2.750 hectare
Indoor coverage provided by over 30 km of radiating cable and numerous in-door antennas

Air France (Paris)

Critical communications for all professional users

Utilities
CLP Holdings
Hong Kong

Automatic fault location and supply rerouting using TETRA data

Source: CLP Holdings Annual Report 2006

Utilities
RWE Power, Germany

TETRA System to operate:

3 Opencast Mines

6 Power Stations

Railway System

24 redundant base stations

Redundant Switch

13 Dispatchers

ISDN gateway

RWE Terminal Requirement

2000 Terminals

- Cars
- Special Vehicles
- Baggers
- Trains

Hostile Environment !

Some Intrinsically Safe

24h/7days

Seaports and rigs

Shipbuilding, container ports and oil rigs

Oil and Gas

Pipelines and refineries in Africa, Asia - Middle East, Europe – Russia and South America

Telemetry and safety

Commercial

Hotels, Universities, Sports Stadiums, Casinos,……..

A hotel in Australia
has a single site
12 user system

and Ferrari !

And ……..

A current TETRA Installation


. . . . . in the Winter !!

TETRA

We believe that North American Users should have the right to choose technologies!

Thank You

Any Questions?

Roger Dowling
e-mail: roger.dowling@sepura.com